

CENTRAL INTELLIGENCE AGENCY
INFORMATION REPORT

REPORT

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SUBJECT Exposure Device for X-Ray Intensity Wedge

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1. Research work in the Department for Crystal Structure Analysis of the
Academy Institute for Medicine and Biology in Berlin-Buch has been
hampered by the lack of an adequate method for determining the in-
tensity of diffraction spots (called "reflexes" in Buch terminology)
in the X-ray film of a crystal.this shortcoming is a serious handicap for
crystal research analysis quite generally and
prevails everywhere. So far, determination of the intensity had to
be carried out by visual estimate, and this procedure involved a
margin of error of from five to thirty percent. While the relatively
small error of five percent is attainable at the beginning of an
observation, it gradually increases to thirty percent as a result of
fatigue caused by long observation time.development of a device
which is supposed to eliminate to a great extent the error due to
subjective estimate. The device is called "The Exposure Device for
X-Ray Intensity Wedge" (Belichtungsgeraet fuer Roentgenintensitaets-
keil); construction plans for the device were finished in late November
1953. With the aid of this device and an evaluation device,expects to
reduce the margin of error in the determination of X-ray intensity to
plus/minus 0.5 percent.3. The Exposure Device works in the following way: The device is provided
with a dark-slide (Kassette) into which the X-ray film of a crystal is
The dark-slide has two diaphragms which can be closed and
opened by means of two slides. The diaphragms are exposed to an X-ray
source after the slides are opened. By rotating the diaphragms two
black "wedges" are produced on the X-ray film of the crystal. The
position of the diaphragms is such that the blackening of the X-ray
film only takes place on the margin of the film, so that the X-ray
picture of the crystal is not disturbed. The black "wedges" are not
uniformly black, but have different shades of blackness. With the aid
of the evaluation device yet to be developed it will be possible to
compare the intensities of the diffraction spots with the "wedges" and
express them in exact figures. The dark-slide is protected by a sheet

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of lead against the X-ray source, so that direct exposure and exposure to scattered rays is impossible. The dimensions of the dark-slide have been selected so that films of several types of X-ray cameras, such as the Weissenberg and De Jong cameras, can be inserted.

25X1 4. Construction of the exposure device has begun in the research laboratory
25X1 of the Institute for Medicine and Biology.

✓ In addition to the considerably increased
25X1 accuracy in the determination of intensities, the following advantages
25X1 will result from the device

- a. Determination of intensities can be performed by non-expert, auxiliary personnel;
- b. Duration of the evaluation of an X-ray picture will be reduced by about eighty percent.

5. The complete device, including the evaluation device, is supposed to be in operating order by the end of 1954.

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